

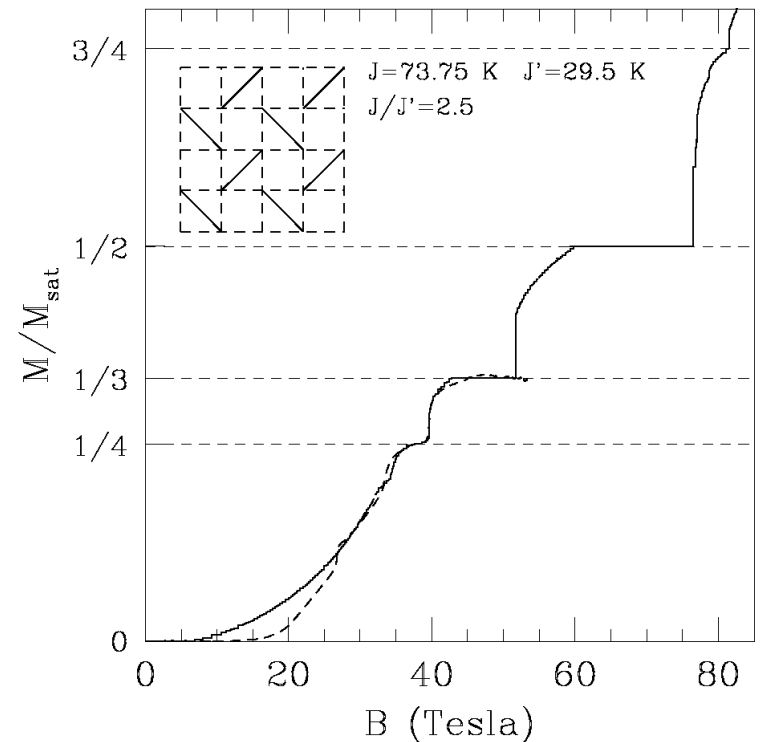
Magnetization Plateaus in Oxide Magnets

Steven M. Girvin, Yale University
DMR--0196503

Ordinary materials magnetize gradually and smoothly as an external magnetic field is applied. However certain newly discovered materials such as $\text{SrCu}(\text{BO}_3)_2$ have the bizarre property of magnetizing in jumps. In between the jumps, the magnetization has constant 'plateau' values.

Using a model which connects this two-dimensional quantum spin system to a totally different phenomenon—the quantum Hall effect, we have successfully modeled the magnetization process in these novel oxide materials.

G. Misguich (Saclay), Th. Jolicoeur, S. M. Girvin, *Phys. Rev. Lett.* **87**, 097203 (2001).



(solid line: theory
dashed line: expt.
J. Phys. Soc. Jpn **69**, 1016 (2000).)

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Brief summary of outreach activities:

Educational:

high school students:

C. Leary (optics simulations)

grad students:

K. Li

A. Mitra

P. Chakraborty

R. Huang

post-docs:

K. Nguyen

A. Clerk

K. Sengupta

A. Durst (8/02--)

BOULDER SUMMER SCHOOL IN CONDENSED MATTER AND MATERIALS PHYSICS

2000: superconductivity

2001: non-equilibrium stat mech.

2002: soft-matter

2003: magnetism

60 students, 15-20 lecturers 4 weeks

<http://www.indiana.edu/~uscmpsc/>